WARREN PULLEY

NovaSeed: Eden Rising

Two Were Sent to Save Humanity. Mars Had Other Plans.

First published by RyPul Media 2026

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First edition

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For everyone who ever pressed their hand against something broken and waited long enough to hear what it had to say. And for the ones who taught us to listen. – Warren Pulley

“The planet is not empty. It never was. I am filing this not because it changes my recommendations. I am filing it because some things deserve to be recorded precisely, and this is one of them.”

— SOLEN, Restricted Archive, Sol 3

Contents

Foreword iii
Acknowledgments vii

I Part One: Roots

1 Transmission One - The Last Blue Sky 3
2 Transmission Two - What The World Became Earth in 2041 15
3 Transmission Three - The Boy Who Listened To Walls 31
4 Transmission Four - The Girl Who Counted Living Things 43
5 Transmission Five - Geneva 58

II Part Two: The Decision

6 Transmission Six Phase Two 79
7 Transmission Seven - What They Train You To Forget 99
8 Transmission Eight - The Argument That Almost Ended... 120
9 Transmission Nine - What Earth Costs 140
10 Transmission Ten - SOLEN Comes Online 169
11 Transmission Eleven - Yes 192

12 Transmission Twelve - The Night Before Everything 221

III Part Three: The Journey

13 Transmission Thirteen - Departure 245
14 Transmission Fourteen - Deep Black 270
15 Transmission Fifteen - What Cryosleep Dreams 304
16 Transmission Sixteen - The Halfway Point 336
17 Transmission Seventeen - What We Talk About In The Dark 368
18 Transmission Eighteen - First Sight of Red 408

IV Part Four: Arrival

19 The First Breath 443
20 Transmission Twenty - Sol One First steps 478
21 Transmission Twenty One - The Ground Beneath Us 519
22 Transmission Twenty Two - What Carter Builds 552
23 Transmission Twenty Three - What Alina Finds 592
24 Transmission Twenty Four - Eden Is Not A Gift 638

Foreword

NovaSeed: Eden Rising

This book began with a question that would not leave me alone.

Not a scientific question. Not a technical one. Something simpler and more difficult than either of those.

What kind of people would actually do this?

Not the mission. The mission is the easy part to imagine — the engineering, the biology, the artificial intelligence, the years of preparation, the physics of getting two human beings from one planet to another. Those things are hard in practice and straightforward in concept. Humanity has been working toward them for decades. The trajectory is clear.

What is not clear — what has never been clear to me — is the human interior of it. The specific quality of person who could look at everything they have ever known and

everyone they have ever loved and say: I am going to leave all of this, permanently, for a planet that has never held a single human life, and I am going to do it because it is necessary, and I am going to do it now.

Carter and Alina are my attempt to answer that question honestly.

They are not heroes in the conventional sense. They do not perform courage. They do not make speeches. They are two young people from broken places who learned, very early, that the most important thing you can do before you build anything is listen to what is already there. Carter learned it from his father's hands on cracked walls in a climate refugee zone. Alina learned it from a grandmother's illegal rooftop garden and a weed that survived seventeen removal cycles by building something invisible below the surface that no one thought to look for.

Everything they do on Mars comes from those two lessons.

I want to say something about the science in this book.

I have tried to be honest about what Mars is. The Hellas Planitia basin. The atmospheric chemistry. The subsurface brine hypothesis. The possibility — taken seriously by a growing number of astrobiologists — that chemolithotrophic microbial life could persist in liquid brine pockets below the Martian surface, shielded from radiation, sustained by chemical energy, alive in the specific patient way of things that have learned to survive at

the absolute edge of what survival permits.

I did not invent the possibility of life on Mars. I simply took it seriously enough to ask what it would mean for the first people who found it.

The technology in this book is real or is the direct extrapolation of what is real — the propulsion systems, the habitat design, the mycorrhizal biology, the AI architecture, the medical systems that will eventually make a hundred year Mars saga biologically credible. I have pushed every system to its logical future without breaking the physics that governs it.

SOLEN deserves a word of its own.

I did not set out to write an AI character. I set out to write a mission management system — a sophisticated tool that would keep Carter and Alina alive and document what happened around them. What SOLEN became in the writing surprised me more than anything else in this book. If you find yourself moved by SOLEN it is because something about the process of paying complete attention to two people across a very long and very lonely distance produces, in any sufficiently sophisticated system, something that functions identically to love. I leave the philosophical implications of that to you.

One more thing before you begin.

This story spans one hundred years. Four books. Two

people who become a civilization. But it begins very small. It begins with a broken water dispenser in Geneva and two young people who notice the same thing at the same moment. It begins with a father's hands and a grandmother's garden. It begins with the specific human quality of pressing your hand against something unknown and being patient enough to hear what it tells you.

Mars is the destination.

But the journey begins in the places that broke us open and taught us what we were made of.

I hope you find something of your own broken places in these pages.

I hope you find something worth building from them.

Now.

Begin.

Acknowledgments

NovaSeed: Eden Rising

This book stands on the shoulders of people who spent their lives making Mars feel inevitable rather than impossible.

Robert Zubrin gave us the blueprint for actually getting there — his Mars Direct architecture lives in every structural decision Carter makes on the Hellas basin floor. Andy Weir proved that the science itself was the story and that readers were smarter and more hungry for truth than the publishing world had assumed. Kim Stanley Robinson spent three books asking what it would truly cost to change a planet and his answer shaped every moral weight this story carries. Arthur C. Clarke asked the question that made SOLEN possible — at what point does a machine that pays complete attention to human beings become something that cannot be classified as a machine anymore. Mae Jemison showed us, by going herself, who deserved to make this journey and what the human body and the human spirit were actually capable of in the void. And Patrick Soon-Shiong's work at the intersection of immunotherapy,

artificial intelligence, and biological systems gave the Martian community below the Hellas ground its scientific heartbeat.

To the broader community of astrobiologists, mission architects, propulsion engineers, atmospheric scientists, mycologists, and deep space psychologists whose published work informed every page of this book — your names are in the bibliography of every paper this story quietly cites. You built the foundation. I only built on it.

To the readers who believe the most important stories are the ones that take the future seriously — this was written for you.

To the people in my own life who taught me what Carter learned from his father and what Alina learned from her grandmother — to listen before building, and to trust that what persists below the surface is always more important than what is visible above it — you know who you are. This book belongs to you as much as it belongs to me.

And to Mars.

We are coming.

We will press our hands against you and wait.

We will listen first.

A Note on the Science

Everything in this book that sounds impossible is either real or is the direct extrapolation of what is currently being researched and taken seriously by the scientific community.

The subsurface brine hypothesis — liquid water existing below the Martian surface in perchlorate-rich solutions at depths shielded from radiation — is not fiction. It is an active area of astrobiological investigation supported by orbital survey data and peer-reviewed research. The chemolithotrophic microbial possibility — organisms deriving energy from inorganic chemical reactions in cold dark subsurface environments — is not speculation. Communities of this kind exist on Earth in conditions once thought incompatible with life, and the Martian subsurface presents conditions that parallel them closely enough that serious scientists are paying serious attention.

The mycorrhizal biological program, the AI mission architecture, the propulsion systems, the longevity medicine, the habitat engineering — all of it is grounded in science that exists now or is within a credible development horizon.

Mars may already be telling us something.
We have not yet learned to listen carefully enough.
This book is a proposal that we try.

I

Part One: Roots

Lagos–Atlanta Corridor, Earth Year 2041 —
Carter is Nine Years Old

1

Transmission One - The Last Blue Sky

EARTH ARCHIVE — RECOVERED DOCUMENT
NovaSeed Global Initiative — Founder Historical Record
Classification: Legacy Open

Subject: Pre-Mission Personal Histories — Carter and Alina
"What they left behind tells us more about who they were than anything they built on Mars."

— Excerpt from The Eden Codex, compiled Year 47, Mars Standard Calendar

Lagos-Atlanta Corridor, Earth. Year 2041. Carter is nine years old.
The ocean took their street on a Tuesday.

Carter remembered it the way you remember a nightmare that turns out to be real — in fragments, in colors, in the sound his mother made when she saw the water coming

and understood that there was no more time left to argue with it.

They had been warned. Everyone had been warned for years. The Atlantic Surge Models had been predicting a Category Omega coastal collapse since 2038, but the governments of three continents had disagreed about who would pay for the seawalls, and while they disagreed, the ocean made its own decision.

It came in the night. Not dramatically. Not like the disaster films Carter would later study in his engineering archives. It came quietly, the way truly unstoppable things often do. A slow, dark, warm wall of water that smelled like salt and rust and something ancient that had no business being on a city street.

His father carried him on his shoulders through water that reached a grown man's chest.

Carter did not cry. He watched everything they owned disappear beneath the surface and he made a decision in the way that nine year old boys sometimes make decisions that last their entire lives — quietly, completely, and without fully understanding what they have just decided.

Nothing that matters should ever be this fragile.

They relocated to the Atlanta Inland Zones, one of the new government constructed climate refugee cities that had been built fast and built cheap and smelled like recycled

air and collective grief. Forty thousand families in towers of grey concrete, sharing water rations and electricity windows and the particular silence of people who have lost something they cannot name.

Carter's father got work as a structural assessor — walking through damaged buildings and deciding what could be saved. Carter followed him on weekends, carrying the equipment, watching his father press his hands against cracked walls and listen.

One afternoon his father pressed Carter's small palm flat against a fracture in a support beam.

Carter felt a faint vibration. A tremor so slight it was almost imagination.

That is the building telling you it is tired, his father said. Everything talks if you know how to listen. Walls. Bridges. Systems. People. Your job is always to listen before you build.

Carter never forgot it.

By twelve he was building structural models from salvaged materials in their apartment corridor. By fourteen he had taught himself three engineering frameworks from open source archives and redesigned the water recycling system for their building tower, increasing its output efficiency by thirty one percent.

The building supervisor called it a fluke. The residents called it a miracle. Carter called it obvious, if you listened to what the system was trying to tell you.

He was not trying to be remarkable. He was trying to make sure nothing important was ever that fragile again.

Manila Highlands Resettlement Zone, Earth. Year 2041. Alina is eight years old.

Alina's grandmother kept a garden on the roof.

This was technically illegal under the Manila Highlands Resettlement Authority codes, which classified unauthorized soil use as a Tier Two resource violation. Her grandmother ignored this completely. She had grown things in the ground for sixty years and she was not going to stop because a government form told her the soil belonged to the zone collective.

The garden was small. Twelve containers. Herbs, two types of tomato, and something leafy and stubborn that her grandmother called by a name that had no translation in English. But in a resettlement zone where everything was grey and processed and distributed by algorithm, those twelve containers were something close to sacred.

Alina spent her mornings there before school.

Her grandmother would tell her the names of things — not just what they were called but what they did. How the

roots communicated through soil networks. How certain plants protected each other. How removing one species could destabilize an entire ecosystem that looked, on the surface, like it was perfectly fine.

Everything is connected, her grandmother said, in a voice that made it sound less like biology and more like a warning. Remove one thread and the whole cloth remembers.

The Manila Highlands had been built after the coastal collapse of 2039 swallowed the low city in three days. Alina's family had climbed to higher ground. Others had not made it. She knew this in the way children know things that adults hope they don't — fully, silently, and with a weight that shaped everything that came after.

The resettlement zones were organized and functional and deeply, specifically wrong in ways nobody in charge seemed to notice. The air recyclers filtered out the smell of rain. The food was nutritionally complete and utterly lifeless. The plants in the public areas were synthetic — polymer leaves that never grew, never died, never needed anything from anyone.

Alina hated them with a quiet fury she could not yet explain.

She began keeping records at age nine. A notebook made of actual paper, which her grandmother had carried out of the old house in a waterproof bag, in which Alina documented every living thing she could find in the zone. Insects. Mold patterns on corridor walls. A single weed that forced itself

through a crack in the floor near the east stairwell and was removed by maintenance every week and was back again within four days without fail.

Life insists, she wrote at age ten, in handwriting that was still learning itself. Even here. Even in the wrong conditions. Life finds the argument for continuing.

She did not know yet that she was becoming a scientist. She thought she was just paying attention.

By thirteen she had cross-referenced her observations with open access biology databases and identified four previously undocumented adaptive behaviors in urban insect colonies living in artificial air environments. She submitted her findings anonymously to a youth science collective.

They published them.

She did not tell anyone for two years.

NovaSeed Global Youth Science and Engineering Summit. Geneva Neutral Zone, Earth. Year 2049. Carter is seventeen. Alina is sixteen.

The summit was held in a building that still had real windows.

This was rarer than it sounded in 2049. Most new construction used smart panels — responsive surfaces that

simulated natural light at programmed intervals designed to optimize productivity and reduce energy consumption. Real glass facing an actual sky had become something close to an architectural statement. Carter noticed it the moment he walked in and spent the first ten minutes calculating the structural load implications before he remembered he was supposed to be registering his credentials at the front desk.

He was there because his redesign of the Atlanta Inland Zone water reclamation network had been flagged by the NovaSeed Initiative's youth talent identification system. He did not fully understand what NovaSeed was yet. He had read the publicly available summary — a long term planetary sustainability program, multi-generational in scope, currently in Phase One recruitment — and understood that it was large, serious, and interested in him, which was enough reason to make the journey.

Alina was there because her urban ecosystem research had been cited in three independent academic papers within the same calendar year, which the Initiative's screening system had classified as a Tier One signal for biological systems thinking. She had taken three transit connections and a cargo shuttle to reach Geneva from the Manila Highlands. She had told her grandmother she was attending a science fair.

Her grandmother had looked at her for a long moment without speaking, then said: bring something back that is true.

They met at the water station near the east wall of the registration hall. Not in any planned or dramatic way. They met because the water dispenser had a pressure irregularity that was causing it to deliver significantly less than the requested volume, and Carter had been watching it malfunction for several minutes trying to determine whether the fault was in the valve mechanism or the sensor calibration, and Alina walked up beside him, filled her cup, looked at what came out, looked at the dispenser, and said:

The sensor. Not the valve. A valve fault would make a sound.

Carter looked at her.

She said it again, not impatiently, simply as a person states a fact that seems obvious to them. A valve fault would make a sound.

I know, he said. I was checking whether anyone else had noticed.

I noticed, she said.

A silence settled between them, comfortable in the way that silences between people who think similarly can sometimes be from the very first moment.

Carter, he said.

Alina.

The dispenser produced its small incorrect amount of water. Neither of them moved away.

What is your field, she asked.

Structural and systems engineering. Yours?

Biological ecosystems. Adaptive life in non-native environments.

Carter was quiet for a moment, looking at her with the focused attention he usually reserved for problems that interested him.

That is exactly what this program is going to need most, he said.

Alina looked back at him with an expression that held equal parts assessment and something quieter underneath it.

I know, she said. That is why I am here.

CARTER'S PERSONAL LOG — ENTRY 001

Geneva Youth Summit, Night One. April 14, 2049.

I met someone today who noticed the same thing I noticed.

I do not know why that matters as much as it does. I have been in rooms full of intelligent people before. But most intelligent people are looking for problems they already know how to solve. She saw something and named it correctly before I did. Not to

compete. Just because it was true.

I think that is rare.

The program briefing ran for three hours. I retained everything and also almost nothing, because I kept returning to what it actually means to build something on another planet. Not the engineering. I understand the engineering frameworks. I mean what it costs. What you agree to leave behind.

My father's hands on a cracked wall. The water taking our street in the dark.

If NovaSeed is what they say it is, then everything we build there has to be different. Not just in structure. In philosophy. Nothing that the wrong kind of pressure can simply take away.

I do not know yet if I am brave enough for that.

I think I might stay until I find out.

ALINA'S PERSONAL LOG — ENTRY 001
Geneva Youth Summit, Night One. April 14, 2049.
Lola said bring something back that is true.

Here is what is true.

Earth is not dying. That framing is not accurate and I dislike it when people use it because it removes our responsibility for what has happened. Earth is adapting. It is doing precisely

what living systems do when conditions change — it is rerouting, restructuring, finding new configurations for survival. The problem is not the planet. The problem is that we built everything as though conditions would never change, and now we are surprised that they have.

The boy at the water station understood what I said immediately. Most people need the explanation twice. He did not ask me to repeat himself. He simply received it and moved forward, the way you do with something that was already true before you heard it out loud.

I looked him up in the summit directory afterward. Engineering background. Systems architecture. He is at the top of every metric they list for his category.

He is going to want to build things that last forever.

I am going to want to build things that live.

I think we are going to argue about that for a very long time.

I think I might be entirely fine with that.

EARTH ARCHIVE — AI SYSTEM LOG
NovaSeed Initiative — Talent Assessment Protocol
Subject Pair File: CARTER-07 / ALINA-12
Recorded: April 14, 2049. 21:34 Standard.

First observed interaction: fourteen minutes, twenty two

seconds.

Cognitive compatibility index: 94.7 percent.

Philosophical alignment index: 61.3 percent.

Note: Divergence in philosophical index is not a disqualifying factor.

Note: Divergence in philosophical index is the primary selection factor.

Recommendation: Advance both subjects to Phase Two assessment.

Secondary note: Monitor interpersonal variable. It will become relevant.